CLASS-7

LESSON-3 DATA HANDLING

(This PDF Based on NCERT Book)

REPRESENTATIVE VALUES(प्रतिनिधि मान)- In simple words, a **Representative Value** is a single number that summarizes or stands in for a whole set of numbers. It gives you a sense of what's "typical" or "average" for that group.

The three most common types of representative values are:

- **Mean (Average):** You add up all the numbers and divide by how many numbers there are.
- **Median:** You arrange all the numbers from smallest to largest and find the middle number.
- **Mode:** This is the number that appears most often in the set.

1. **ARTHEMETIC MEAN OR MEAN(समांतर माध्य)-**The **arithmetic mean**, often simply called the **mean** or **average**, is the sum of a collection of numbers divided by the count of numbers in the collection. It is the most common type of average and is a measure of central tendency.

How to Calculate the Arithmetic Mean

To find the arithmetic mean, follow these simple steps:

1. **Add up** all the numbers in the data set.
2. **Count** how many numbers there are in the set.
3. **Divide** the sum from step 1 by the count from step 2.

Formula-

The formula for the arithmetic mean is:

$$\text{Arithmetic Mean} = \frac{SUM\ OF\ ALL\ VALUES}{NUMBER\ OF\ ALL\ VALUES}$$

Example

Let's say you want to find the average score of a student who scored 85, 90, 78, and 92 on four quizzes.

1. **Sum of the values:** 85+90+78+92=345
2. **Number of values:** There are 4 quiz scores.
3. **Divide:** 345÷4=86.25

So, the arithmetic mean (average) score is **86.25**.

RANGE(परिसर)-It is the difference between the highest and lowest values.

FORMULA- **Range=Highest Value−Lowest Value**

2. **MEADIAN(माध्यक)-**The **median** is the middle value in a data set when the values are arranged in order.

How to Find the Median

The steps to find the median depend on whether the data set has an odd or even number of values.

Case 1: Odd Number of Values

If there's an odd number of values in the data set, the median is the single number that falls exactly in the middle.

Steps:

1. Arrange the numbers in ascending order (from smallest to largest).
2. The median is the middle value in the sorted list.

Example: Find the median of the data set: 10, 5, 20, 15, 25.

1. First, sort the numbers: 5, 10, **15**, 20, 25.
2. The middle number is **15**. So, the median is 15.

Case 2: Even Number of Values

If there's an even number of values, there isn't a single middle number. In this case, the median is the average of the two middle numbers.

Steps:

1. Arrange the numbers in ascending order.
2. Find the two middle values.
3. Calculate the arithmetic mean (average) of these two values.

Example: Find the median of the data set: 10, 5, 20, 15.

1. First, sort the numbers: 5, **10**, **15**, 20.
2. The two middle numbers are 10 and 15.
3. Calculate their average: (10+15)÷2=25÷2=12.5.
4. So, the median is **12.5**

3. **MODE(बहुलक)-** The **mode** is the value that appears most frequently in a data set.

How to Find the Mode

To find the mode, you simply count the number of times each value appears in the data set. The value with the highest count is the mode.

- A data set can have **one mode** (unimodal).
- It can have **multiple modes** if two or more values share the highest frequency (e.g., bimodal for two modes, trimodal for three, and multimodal for more than one).
- It can also have **no mode** at all if every value appears only once.

Examples

Unimodal (One Mode)(एकरूपी): Data set: 2, 4, 5, **5**, 6, 7

- The number **5** appears twice, which is more than any other number.
- The mode is **5**.

Bimodal (Two Modes)(द्विविध): Data set: 3, 5, **7**, 8, **7**, 5, **7**, 8, **5**

- The number **5** appears three times.
- The number **7** also appears three times.
- Since both 5 and 7 have the highest frequency, the modes are **5 and 7**.

No Mode: Data set: 10, 20, 30, 40, 50

- Each number appears only once.
- There is **no mode**.